SEDIMENTOLOGY OF THE ARTHUR RIVER AREA, NORTHWEST TASMANIA.

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I would like to dedicate this thesis to my mother, Kathy Scott.
She has been such a wonderful source of love, encouragement,
inspiration and support through every moment of my life.

I know how hard she has worked, and how much she has sacrificed to
get me through this growing process.

I hope you can rest now mum,
Love Carol.

Abstract

The Arthur River area is situated on the north-west coast of Tasmania. The rocks outcropping in the area are correlates to the Proterozoic metasedimentary sequences of the Rocky Cape Group. The Rocky Cape group and its correlates dominate the geology of the north western region of Tasmania, but are however, relatively under studied.

The major part of this study involved a detailed analysis of the sedimentology in the Arthur River area, and from this a depositional model was constructed. A comparison of these results with the Rocky Cape Group 'type-section' is also presented. A minor part of this research was structural mapping, which outlines the structural history of the area.

Sedimentological studies showed that the Arthur River area contained three separate facies: a laminated carbonaceous mudstone; quartzarenite; and interbedded siltstone facies. These are interpreted to have been deposited in: a deep, low energy, reducing slope environment; a high energy, shallow marine tidal dominated shelf environment and; a moderate to low energy, outer shelf environment situated above storm wave base, respectively. Interesting sedimentary structures found within these rocks included: guttercasts in facies 1 and 3 and mudcracks in facies 3. The formation of the mudcracks was most probably due to the processes of diastasis.

When the facies were combined into one depositional basin model, it was shown that the palaeo-shoreline of this basin section was striking in a NW-SE direction. The tidal palaeocurrent signature was parallel to this, forming a longshore tidal current system.

The main structure of the area fits with the regional trends outlined for the western correlates of the Rocky Cape Group. Dominant folding is in the NW-SE direction (F1), with minor folding in the NE-SW direction (F2). Faulting in the area may also be related to these stress fields.

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